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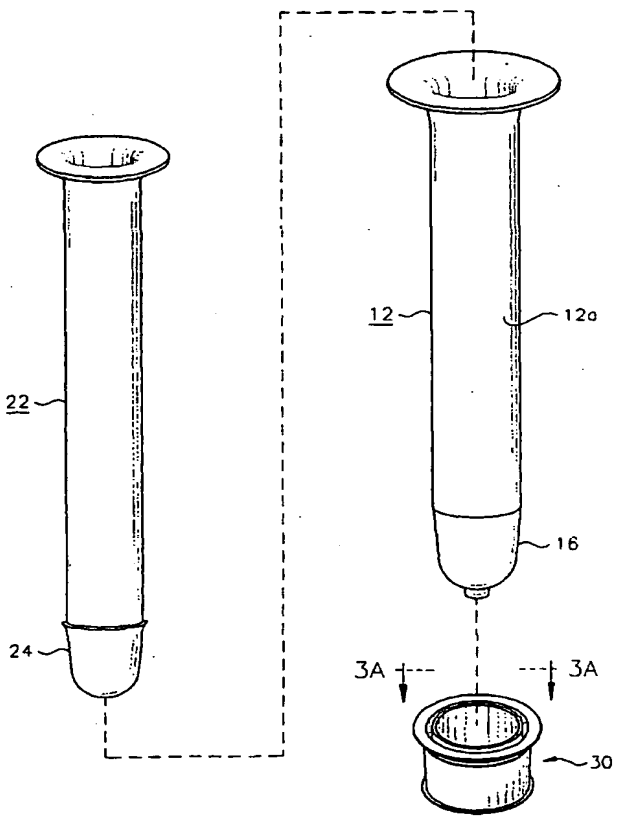
(54) Title: CHILD FRIENDLY SYRINGE



(57) Abstract: A Syringe assembly comprising a elongated hollow tubular barrel made of a plastic material having a discharge opening at one end and open at its opposite end, an elongated hollow tubular plunger member made of plastic material having a closed spherical tip at its outer end and open at its opposite end, means defining a circumferentially extending, radially outwardly directed bead on the plunger of a predetermined diameter relative to the diameter of the barrel to provide a snug sliding fit upon actuation of the plunger axially in the barrel whereby liquid medicament product may be drawn into the barrel when the plunger is actuated in one direction relative to the barrel and dispensed though the discharge opening when the plunger is activated in the opposite direction.

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GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

CHILD FRIENDLY SYRINGE

This application claims the benefit of U.S. Provisional Application No. 60/286,227 filed April 24, 2001.

FIELD OF THE INVENTION

The present invention relates to a syringe type device for administrating medicaments such as liquid baby aspirin to children and more specifically to novel features in such devices which provide a greater acceptance with children and thus may be termed ***CHILD FRIENDLY SYRINGE***.

BACKGROUND OF THE INVENTION

A typical syringe assembly for injecting medicaments of various types includes an outer hollow generally cylindrically barrel made of glass, a plunger usually made of rubber, of a diameter to snugly engage the inner peripheral side wall of the barrel and an elongated plunger rod connected to the plunger for reciprocating the plunger axially in the barrel to draw liquid medicament into the syringe through a needle attached to the discharge end of the barrel. In some instances the syringe assemblies employ a sharp needle for medicaments to be injected into the vein and in other instances the needle comprises a blunt cannula. Even though these instruments are generally effective for the purposes intended, it has been found that children tend to be fearful of syringes having this appearance because they associate use of the syringe with pain associated with use to administer products by skin penetration.

SUMMARY OF THE INVENTION

With the foregoing in mind, it is an object of the present invention to provide a syringe assembly particularly adapted for administering oral dosages of medicaments such as liquid Motrin® or the like to children and which by its appearance and operation may be characterized as a child friendly syringe because it does not invoke fear in the children when they see it. More specifically, the syringe of the present invention is characterized by novel features of construction and arrangement facilitating easy and economical manufacture and molding of the parts and characterized by a novel design which is not threatening to children and thus may be characterized as a child friendly syringe which can be operated easily and quickly to fill with a predetermined dosage and to dispense and reuse.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects of the present invention and various features and details of the operation and construction thereof are hereinafter more fully set forth with reference to the accompanying drawings, wherein:

Figure 1 is an exploded perspective view of the components of a child friendly syringe assembly in accordance with the present invention;

Figure 2A is a side elevational view of the syringe assembly in the assembled relation;

Figure 2B is a transverse sectional view of the syringe assembly taken on lines 2B-2B of Fig. 2A;

Figure 2C is a bottom plane view of the syringe assembly;

Figure 2D is an enlarged view of the portion circled in broken lines;

Figure 3A is a side elevational view showing the application of the child friendly syringe assembly to a medicament container in position to withdraw the medicament contents in the container;

Figure 3B is a transverse cross-sectional view showing the child friendly syringe assembly in position in the neck of the container in a first stage for withdrawing the medicament product from the container;

Figure 4A is a transverse sectional view similar to Fig. 3B showing the barrel of the syringe barrel in a retracted position to withdraw medicament product from the container;

Figure 4B is an enlarged sectional view of the area circled by broken lines identified "4B" in Fig. 4A;

Figure 5A is a transverse sectional view with the syringe assembly removed from the insert;

Figure 5B is an enlarged sectional view showing the insert and starburst fitting with the syringe assembly removed and sealing flow of liquid product from the container;

Figure 6A is a transverse sectional view of the syringe similar to Figure 5A after filing with a predetermined dosage;

Figure 6B is an enlarged sectional view of the portion circled in broken lines in Figure 6A labeled 6B;

Figure 7A is a transverse sectional view of the syringe assembly showing the plunger in its rearmost outer portion in the barrel;

Figure 7B is an enlarged view of the portion circled in broken lines in Figure 7A;

Figure 8A and 8B is an enlarged sectional view showing a modified plunger design in two (2) portions; and

Figure 9 is a view showing the diametrical relationship of elements of the plunger and barrel to locate and seat the plunger in its rearmost outer portion.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings and particularly Figs. 2B and 3B thereof, there is shown a child friendly syringe assembly embodying the present invention, generally designated by the numeral 10. The syringe assembly as illustrated comprises an elongated generally cylindrical hollow tubular barrel 12 which is outwardly flared at its outer end as at 14 to provide a finger grip portion. The outer end of the barrel 12 is rounded or spherical shaped as at 16 and terminates in a short hollow cylindrical projection 18 defining a discharge opening 20. The syringe assembly further includes an elongated plunger 22 having a spherical tip 24 which seats in the barrel 12 and conforms generally to the shape of the barrel 12 to snugly seat in the bottom of the barrel 12 in the manner illustrated in Fig. 2B. The plunger also has an outwardly flared upper end as at 26 to define a circumferentially extending finger grip portion 26.

As best illustrated in Figs. 2A, 2B and 3B, the syringe assembly 10 seats at its tip portion in an insert generally designated by the numeral 30 which fits in the discharge opening 32 in the neck of a container C. The insert 30 has a generally cylindrical outer wall 32 having a radially outwardly, circumferentially extending flange 34 which seats on the axial end face 36 of the container in the manner shown in Fig. 4B. The outer wall 32 has a circumferentially extending sealing lip 40 located axially downwardly from the end flange 34 which snugly engages the interior wall 44 of the container C to function as a seal in this area. A lower sealing flange 46 projects radially outwardly from the lower terminal edge of the outer wall 32 to seal with the interior wall 44 of the container C in the manner shown and prevent medicament

product from migrating into the open region between the outer wall 32 and the interior neck finish during a syringe filling cycle in the manner described below. The insert 30 also has an interior wall 44 co-extensive with and spaced from the outer wall 32 to permit radial flexing when the syringe is seated in the insert 30 to be filled in the manner shown in Figs. 4A and 4B. The interior wall 44 has a beveled upper face as at 52 to conform to the somewhat tapered shape of the barrel 12 to provide a snug seating arrangement when the barrel 12 is pressed into the insert 30 for a filling cycle. The insert 30 has an upwardly flared bottom wall 54 which has a central opening 56. Formed integrally with the opening 56 are a plurality of triangularly shaped leaves 60 in a starburst pattern which can be deflected outwardly by the tip of the barrel 12 in the manner shown in Fig. 4B to permit filling of the syringe by simply withdrawing the plunger in the manner shown in Figs. 4A and 4B.

Consider now briefly the use of the syringe in applications for dispensing oral medicaments to children. The syringe plunger 22 is normally fully seated in the barrel 12 in the manner shown in Fig. 3B. The barrel 12 is normally seated in the insert 30 in the manner shown in Fig. 3A. A sealed medicament bottle C containing the medicament to be dispensed is then readied for the syringe by removing the cap. The syringe assembly is then positioned over the open end of the bottle and the insert 30 is then moved axially into the open end until the flange 34 seats on the axial end face of the bottle C. In this position, the triangularly-shaped leaves 60 are in a spread condition so that when the plunger 22 is drawn rearwardly by the user, medicament can flow into the syringe barrel 12 in the manner indicated by the arrows in Fig. 4B. The user can then withdraw the barrel 12 axially whereby the leaves 60

automatically return to their closed position providing a sufficient seal to protect the contents of the container C. The user can then administer the pre-measured dose of the medicament to a child patient.

Considering now, more specifically, some of the structural details and arrangement of the barrel and plunger of the syringe assembly, the barrel 12 as illustrated has a generally cylindrical elongated body portion 12A of a uniform internal diameter D extending between the nose 16 at one end and the outwardly flared upper portion 14. The nose 16 as illustrated has a slightly inwardly flared spherical tip 16 and merges with body portion 12a in a somewhat conical section 12b which tapers inwardly from the body portion slightly at an angle αof about 5° relative to the axis A-A of the barrel 12. As illustrated in Figs 8A and 8B, the spherical tip 24 of the plunger 22 likewise has a slightly tapered frusto conical section 22bconnecting the spherical tip 24 and the body portion 22a which is also of general uniform diameter for substantially the full length between the spherical tip 24 and flared outer end 26. By this arrangement, the tip and tapered connecting portion of the plunger complement the tip and tapered connecting portion of the barrel for full evacuation of product in the syringe.

As illustrated in Fig. 5A, the upper end of the barrel 12 adjacent the flared end14, is provided with a circumferentially extending ledge 72 and the upper end of the plunger 22 adjacent the flared end 26 is provided with a circumferentially extending ledge 74 for ease and removal of the part during the molding process.

The plunger 22 and barrel 12 are preferably made of different materials for good sliding action between the parts when the plunger is activated axially in the barrel for filling and discharge purposes. In the preferred embodiment the barrel is made of polypropylene. The plunger is made of polyethylene. It has been found that similar materials rubbing against one another tend to stick and cause what is commonly referred to as galling.

In the preferred embodiment, the plunger 22 is provided with a circumferentially extending radially outwardly directed rib 76 adjacent the juncture of the body portion 22A and the tapered transition portion 22B which is preferably of a diameter D1 slightly greater than the internal diameter D2 of the body portion of the barrel 12 to provide a snug but easy sliding fit when the plunger 22 is activated axially in the barrel. Further, the bore 12C of the barrel 12 on either side of a circumferentially extending spherically shaped protrusion 82 on the interior surface of the barrel body portion adjacent its outer end is tapered inwardly at a predetermined angle β toward the protrusion 82 so that the internal diameter D3 in these regions is slightly greater than the diameter D1 of the rib 76 on the plunger. By this arrangement, when the plunger is withdrawn to the position shown in Fig. 7a, the rib 76 on the plunger has a certain amount of play and the user knows that he is at the outer terminal end of the plunger stroke. The protrusion 82 is of a predetermined diameter D3 smaller than the rib diameter D4 to provide a resistance to removal and complete separation of the plunger from the barrel. However, the rib 76 can be snapped over the protrusion 82 when it is desired to disassemble the parts, for

example, to sterilize due to the flexibility afforded by the materials and all thickness of the barrel and plunger.

Figs 8A and 9A shown a modified plunger 22 having a pin like projection 90 which extends downwardly from the spherical tip to engage in the collar 18 when the plunger 22 is fully seated in the barrel 12.

Even though particular embodiments of the present invention have been illustrated and described herein, it is not intended to limit the invention and changes and modifications may be made therein within the scope of the following claims.

CLAIMS

What is claimed is:

1. A syringe assembly comprising a elongated hollow tubular barrel made of a plastic material having a discharge opening at one end and open at its opposite end, an elongated hollow tubular plunger member made of plastic material having a closed spherical tip at its outer end and open at its opposite end, means defining a circumferentially extending, radially outwardly directed bead on the plunger of a predetermined diameter relative to the diameter of the barrel to provide a snug sliding fit upon actuation of the plunger axially in the barrel whereby liquid medicament product may be drawn into the barrel when the plunger is actuated in one direction relative to the barrel and dispensed though the discharge opening when the plunger is activated in the opposite direction.

2. A syringe assembly as claimed in Claim 1, wherein the barrel and plunger tips are of complementary spherical shape and wherein the discharge opening in the plunger is defined by a hollow collar depending downwardly from the outer spherical tip of the barrel.

3. A syringe assembly as claimed in Claim 1, including a spherical projection adjacent the open outer end of the barrel which projects radially inwardly and is of an internal diameter less than the diameter of the plunger rib, the internal bore or wall of the plunger barrel tapering

outwardly slightly adjacent said protrusion so that the diameter of the wall portion in this region is greater than the diameter of the rib to thereby provide a sensory notice to the user that the plunger is in its outermost extended position.

4. A syringe assembly as claimed in Claim 1, wherein the open end of the plunger and barrel are each provided with a gently curved outwardly directed flared portion which provides finger support means for engagement by the user to activate the plunger axially in the barrel.

5. A syringe assembly as claimed in Claim 1, wherein the barrel is and plunger are made of different plastic materials.

6. A syringe assembly as claimed in Claim 1, wherein the barrel is made of polypropylene and the plunger is mae of polyethylene.

7. A system for withdrawing liquid medicament from containers having a body portion and a standard neck portion with a syringe comprising a syringe assembly comprising a elongated hollow tubular barrel made of a plastic material having a discharge opening at one end and open at its opposite end, an elongated hollow tubular plunger member made of plastic material having a closed spherical tip at its outer end and open at its opposite end, means defining a circumferentially extending, radially outwardly directed bead on the plunger of a predetermined diameter relative to the diameter of the barrel to provide a snug sliding fit upon actuation of the plunger axially in the barrel whereby liquid medicament product may be drawn into the barrel when the plunger is

actuated in one direction relative to the barrel and dispensed though the discharge opening when the plunger is activated in the opposite direction an insert of generally cup like shape made of a flexible pliable material comprising an outer generally cylindrical wall having means for snugly engaging and sealing in the neck finish of a container having means for snugly engaging and sealing with the inner wall of the bottle finish, an inner cylindrical wall spaced inwardly from the outer wall so that it can flex to embrace the nose of the barrel of the syringe, means defining a series of flexible fingers in the bottom wall of the insert which are engagable by a collar defining the discharge opening in the barrel of the syringe so that when the syringe is seated in the inner wall of the insert, the collar displaces the fingers outwardly to allow flow of liquid from the container to be drawn into the barrel of the syringe when the plunger is activated, said fingers being flexible so that when the barrel is withdrawn from the insert, the fingers automatically close to prevent further flow.

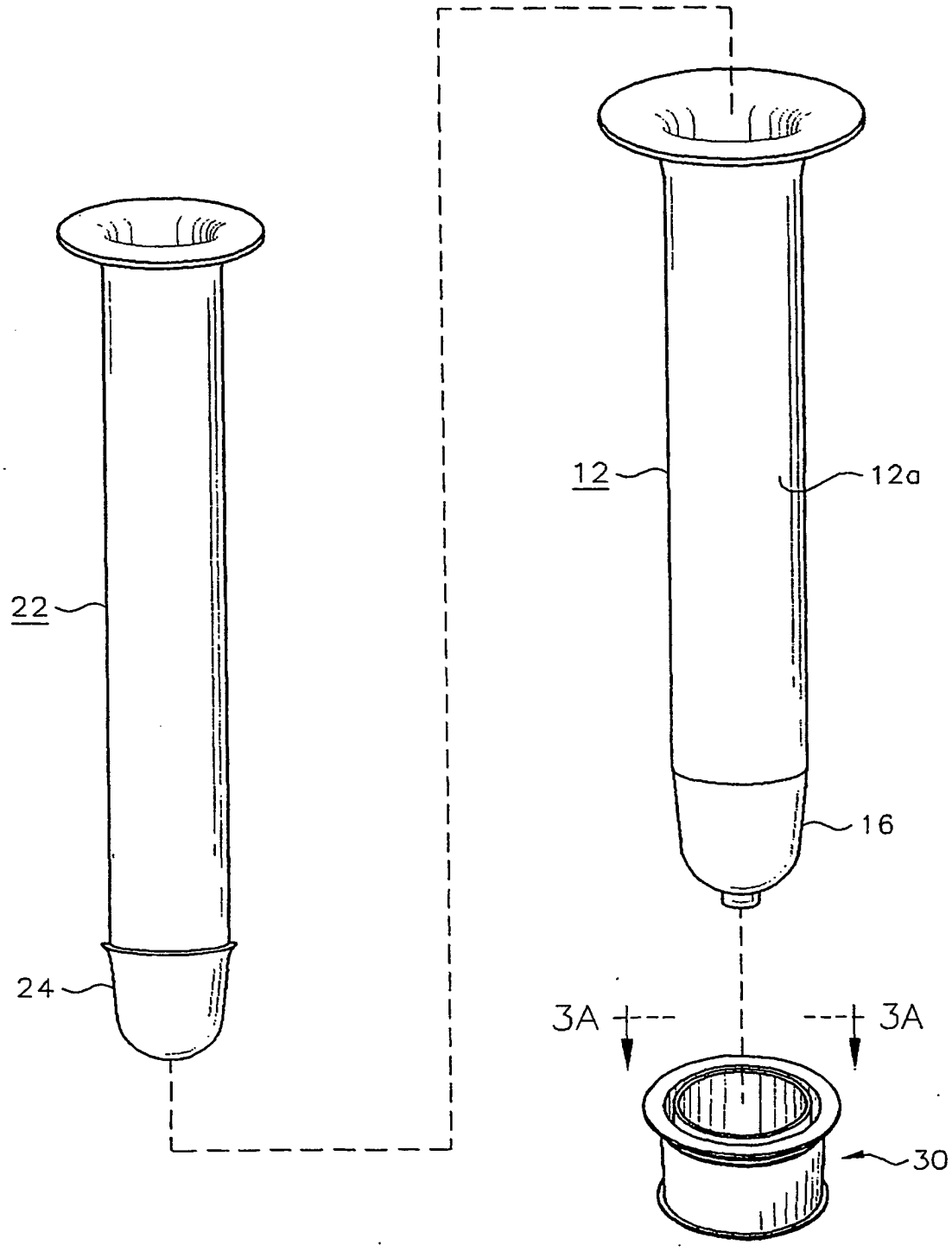


Fig-1

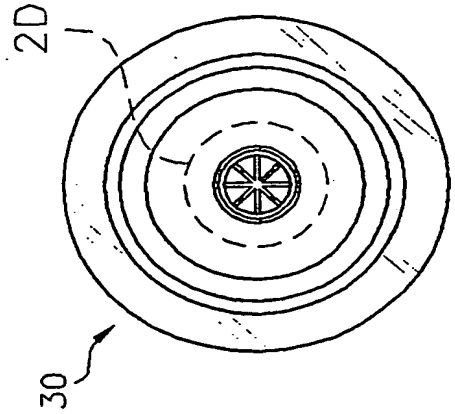


Fig-3A

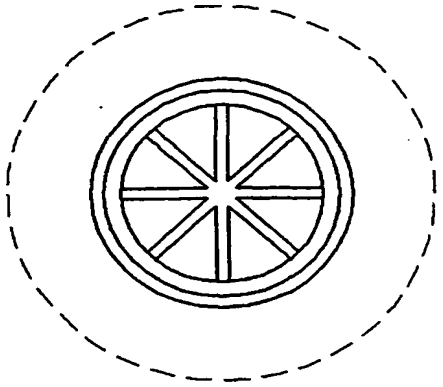


Fig-3B

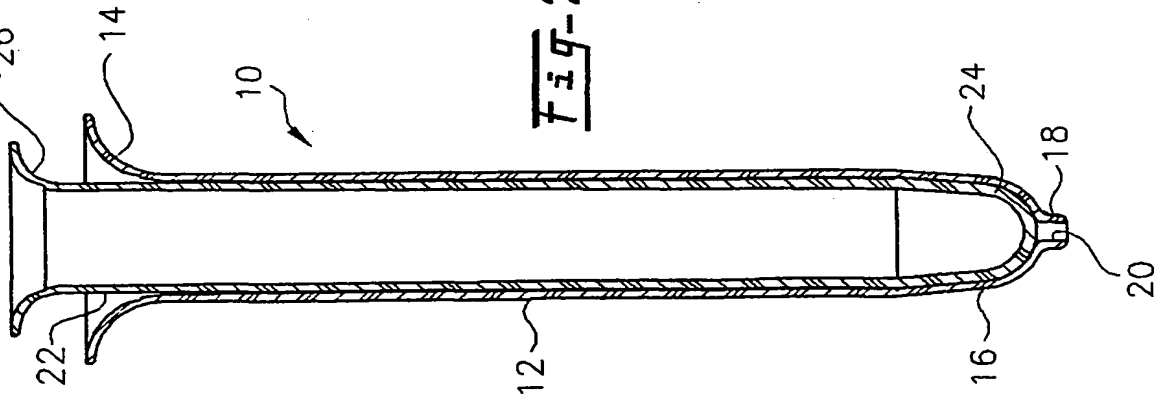


Fig-2B

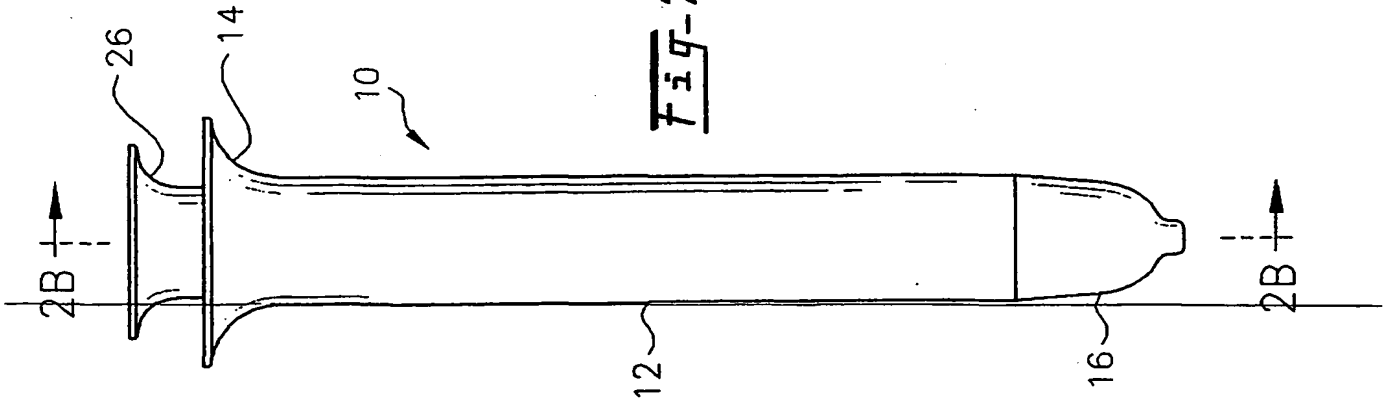


Fig-2A

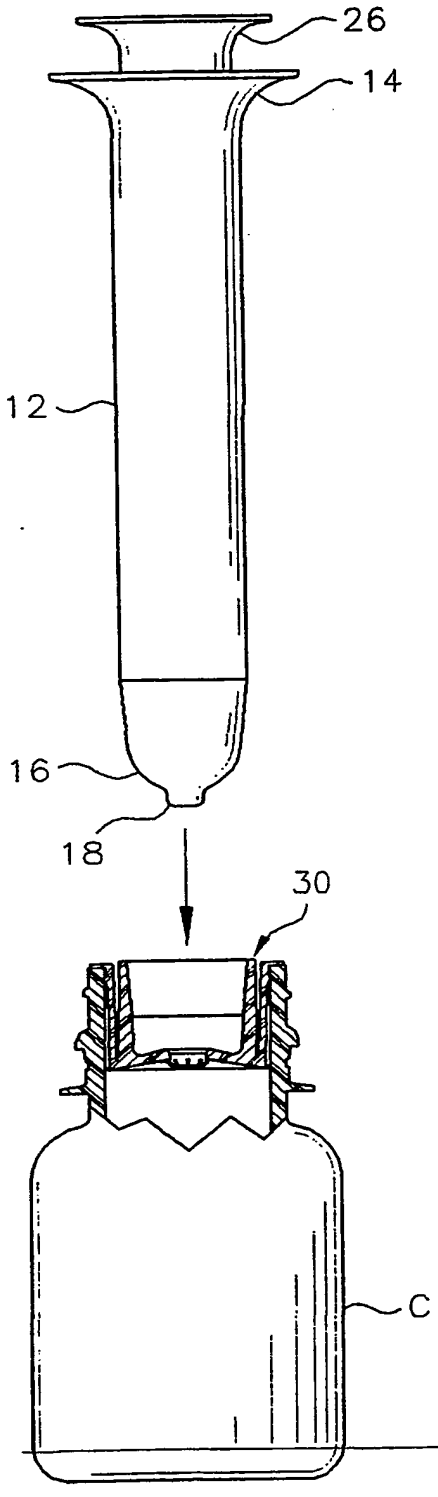


Fig-4A

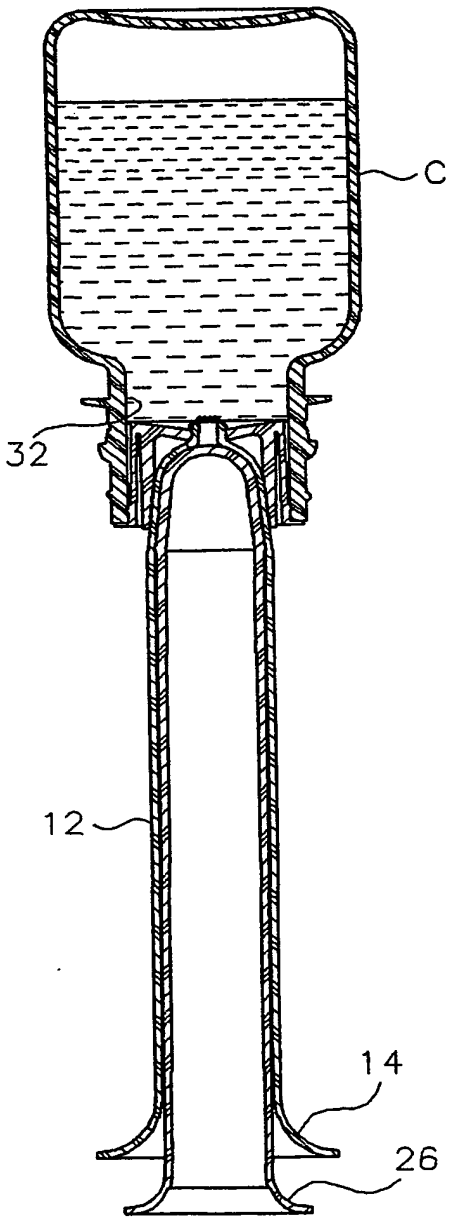


Fig-4B

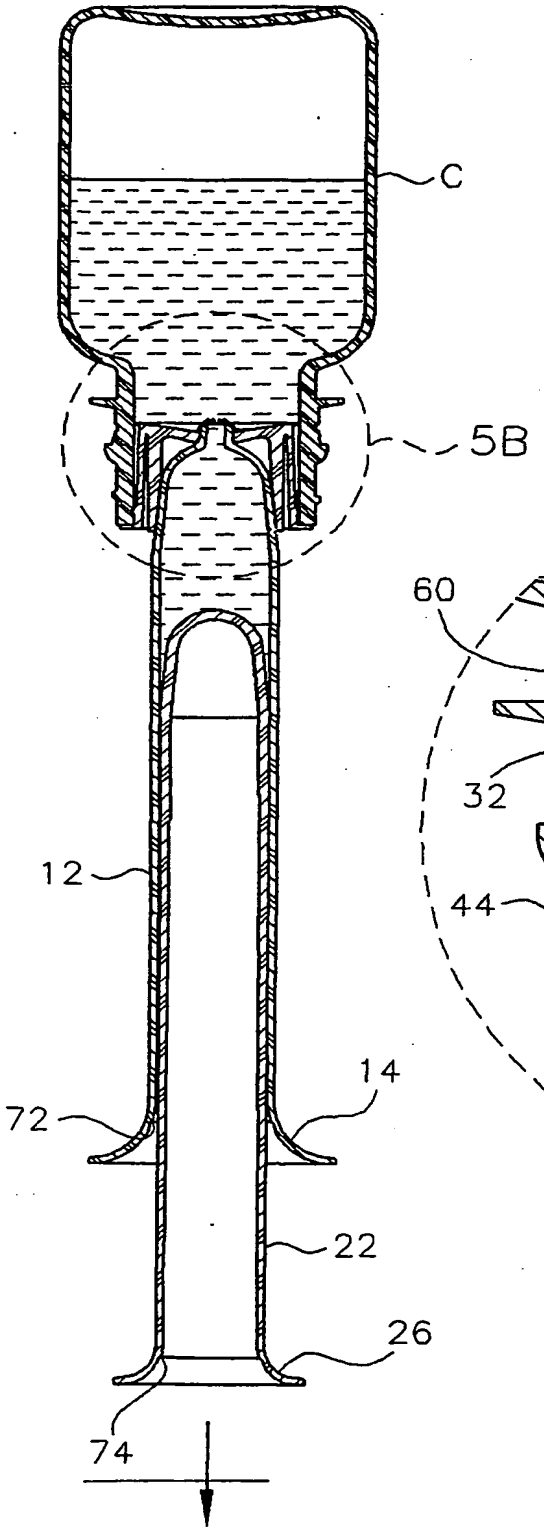


Fig-5A

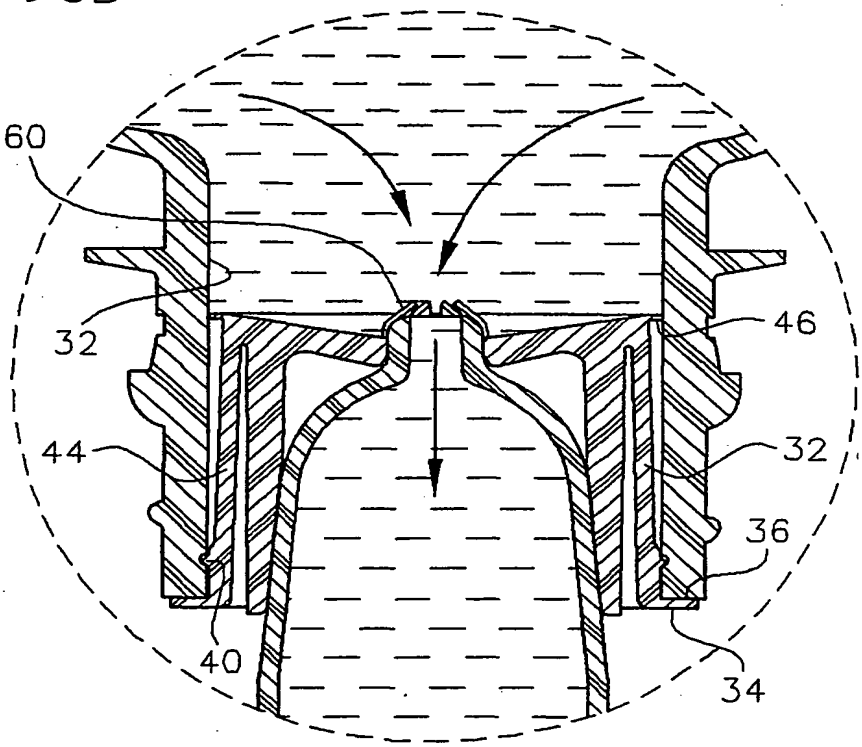


Fig-5B

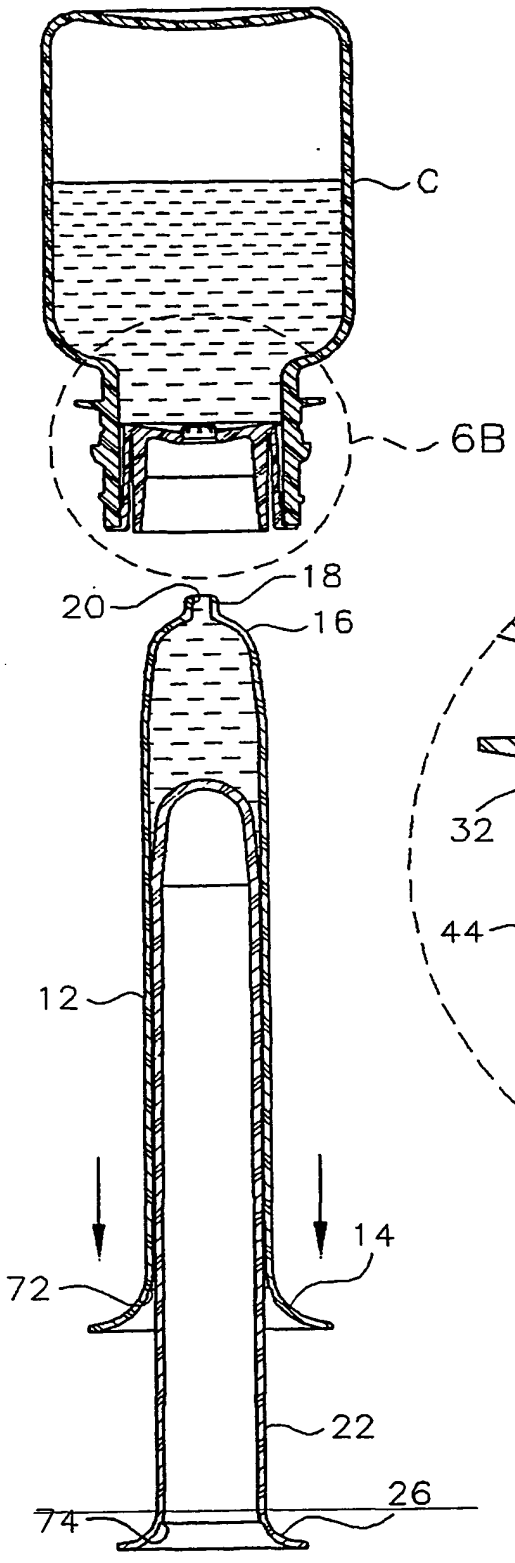


Fig-6A

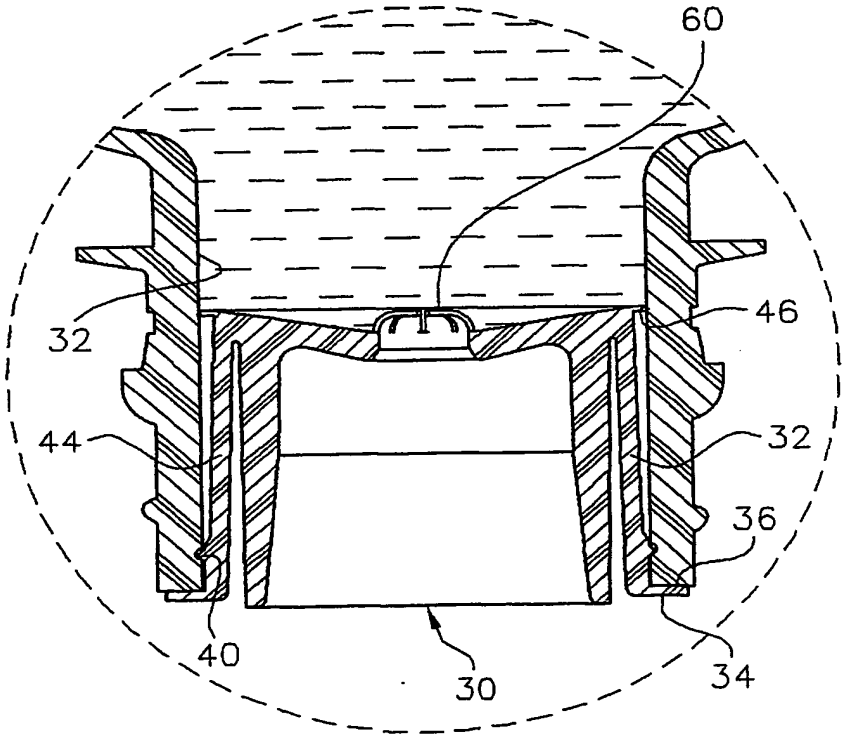


Fig-6B

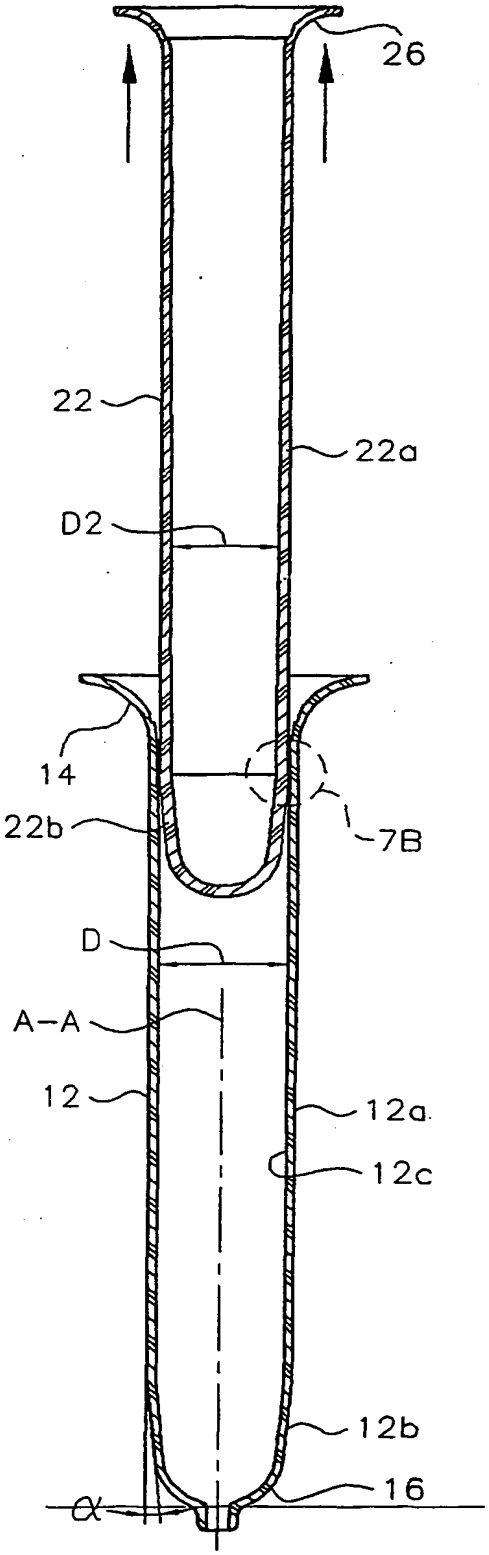


Fig-7A

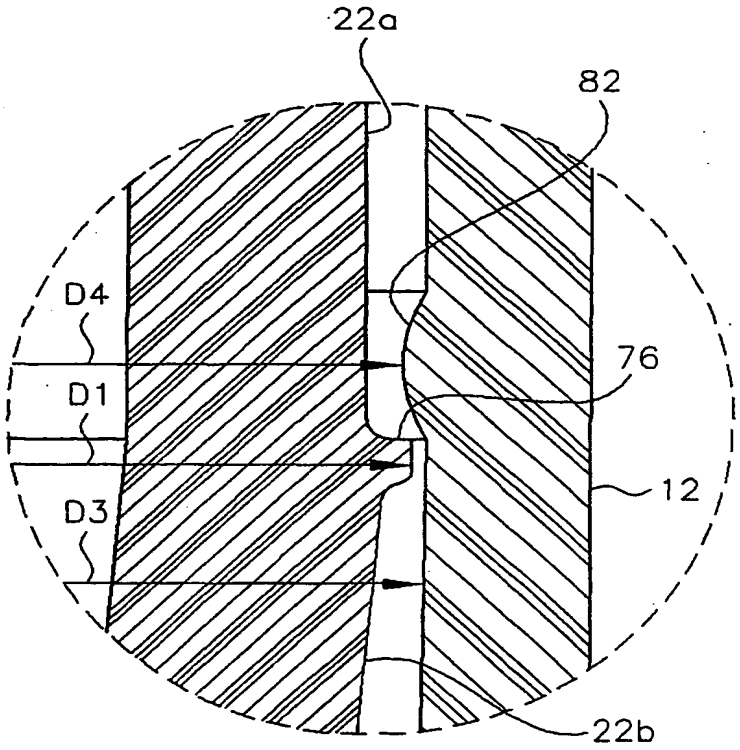


Fig-7B

Fig-8A

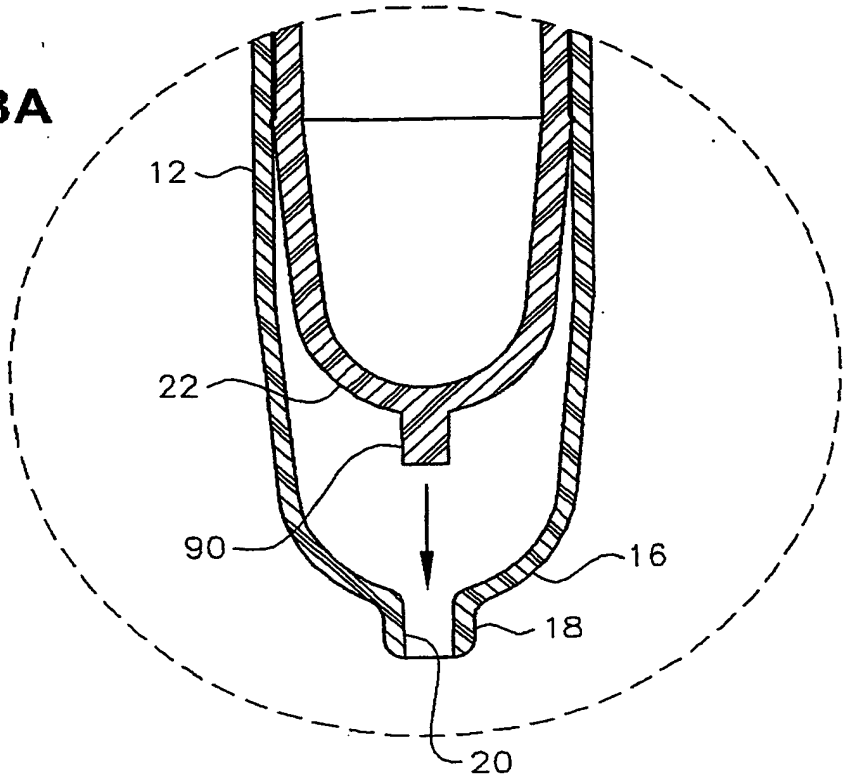
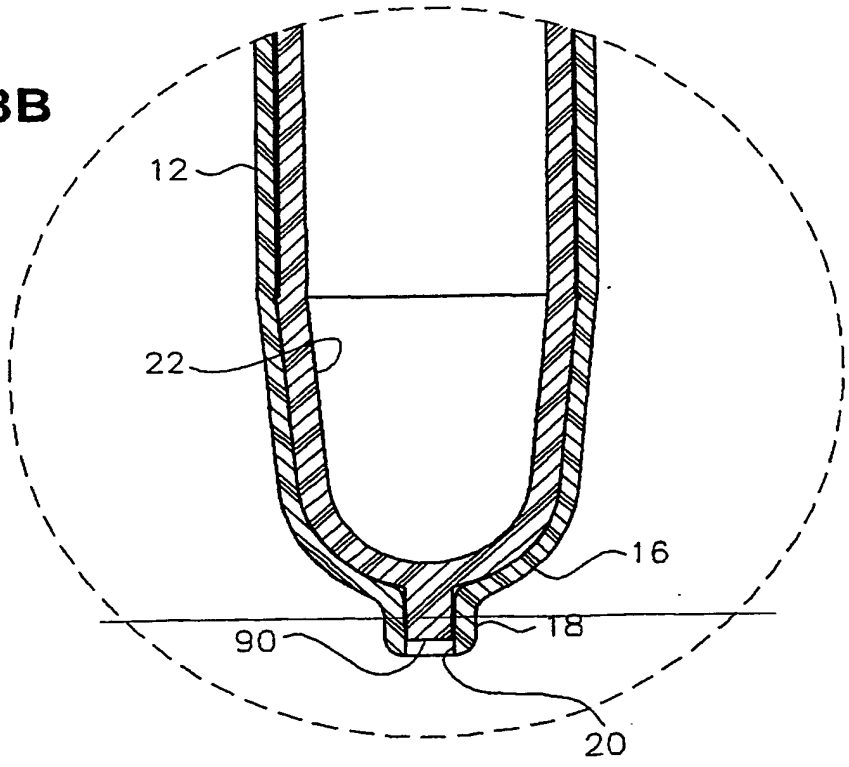


Fig-8B



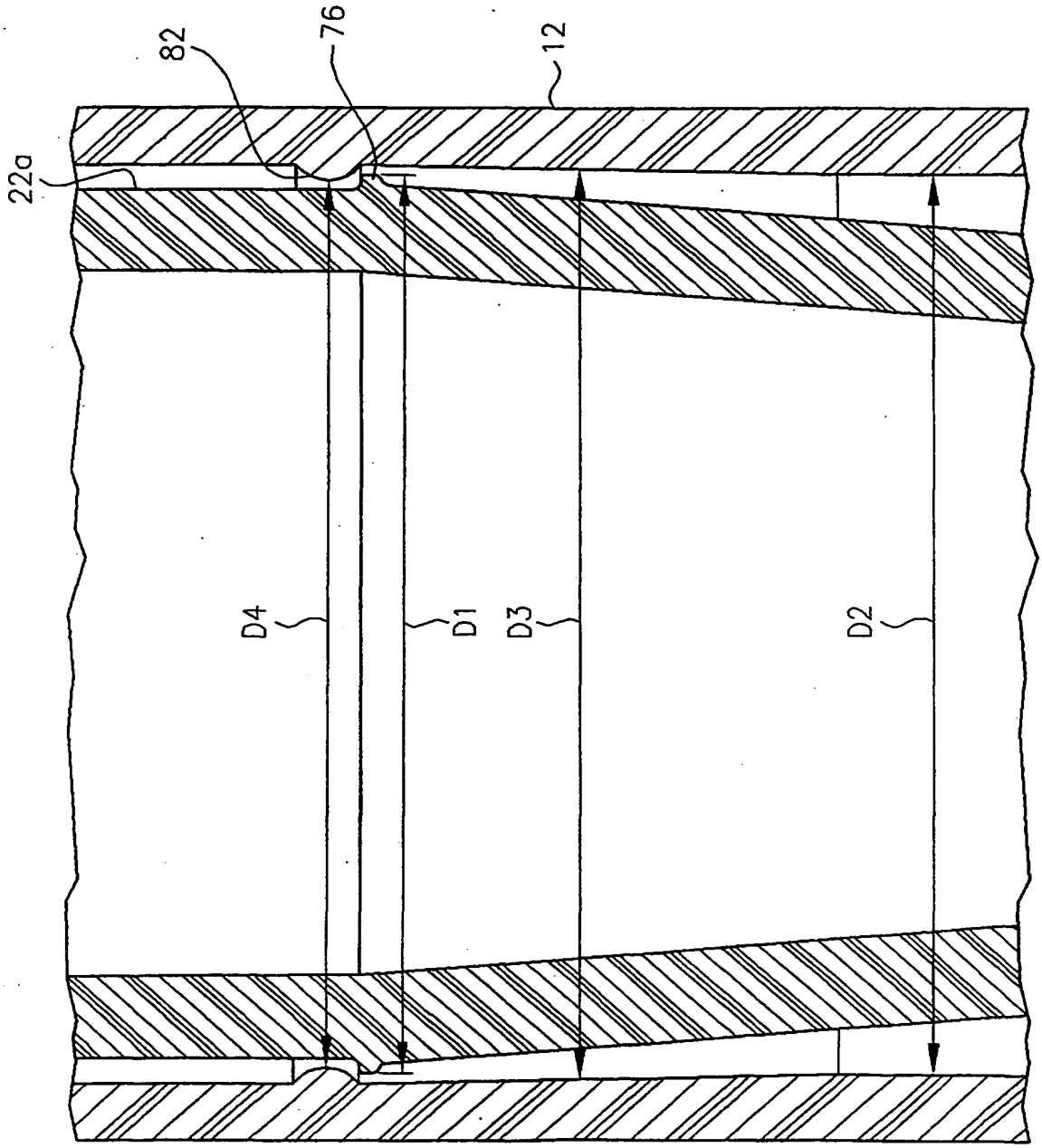


Fig-9

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(74) Agent: RENZ, Eugene, E., Jr.; Eugene E. Renz, Jr., P.C., 205 North Monroe Street, Post Office Box 2056, Media, PA 19063 (US).

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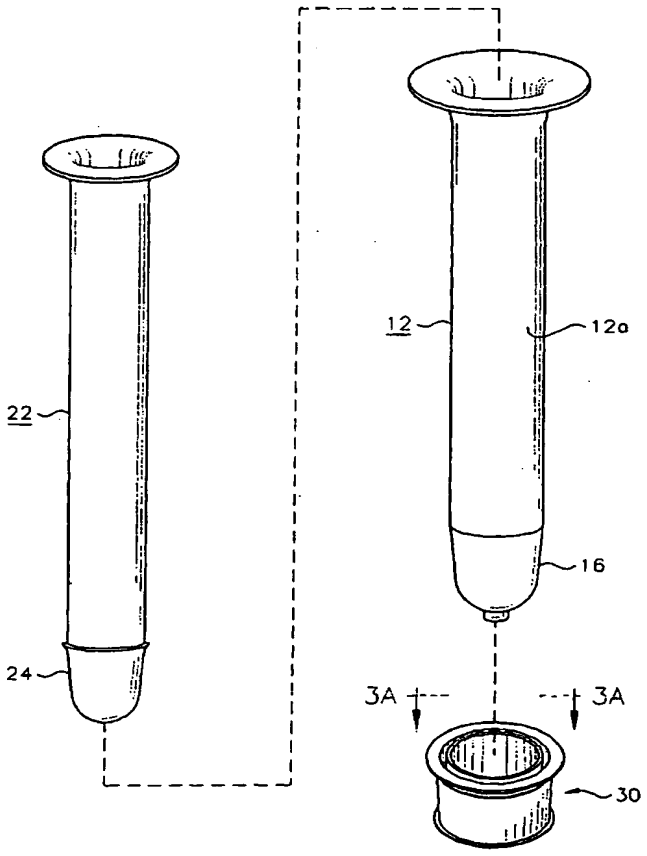
(54) Title: CHILD FRIENDLY SYRINGE



(57) Abstract: A Syringe assembly (10) comprising a elongated hollow tubular barrel (12) made of a plastic material having a discharge opening (20) at one end and open at its opposite end, spherical tip (24) at its outer end and open at is opposite end, mans defining circumferentially extending, radially outwardly directed bead on the plunger (22) of a predetermined diameter relative to the diameter of the barrel (12) whereby liquid medicament product may be drown into the barrel (12) when the plunger (22) is actuated in one direction relative to the barrel (12) and dispendsed though the discharge opening when the plunger (22) is activated in the opposite direction.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US02/12592

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61M 5/315, 25/00, 5/00, 5/32, 31/00, 29/00; A61K 9/02
US CL :Please See Extra Sheet.
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 604/181, 198, 218, 263, 60, 288, 131, 805, 205, 187, 111, 192, 533

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5827233 A (FUTAGAWAA ET AL) 27 OCTOBER 1998.	1-7
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☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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Date of the actual completion of the international search

23 OCTOBER 2002

Date of mailing of the international search report

14 APR 2003

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INTERNATIONAL SEARCH REPORT

International application No.
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A. CLASSIFICATION OF SUBJECT MATTER:
US CL :

604/181, 198, 218, 263, 60, 288, 131, 805, 205, 187, 111, 192, 533